

Responding to Climate Variability & Change

A Northern Rockies Nexus

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Department of Interior Regional Climate Science Center: The Northern Rockies Landscape



Scientists and Resource Managers
Collaborating to Provide Decision Support
Technology and Climate Services for
Understanding Change, Ecosystem Response,
and Conservation Strategies

Outline for this Presentation

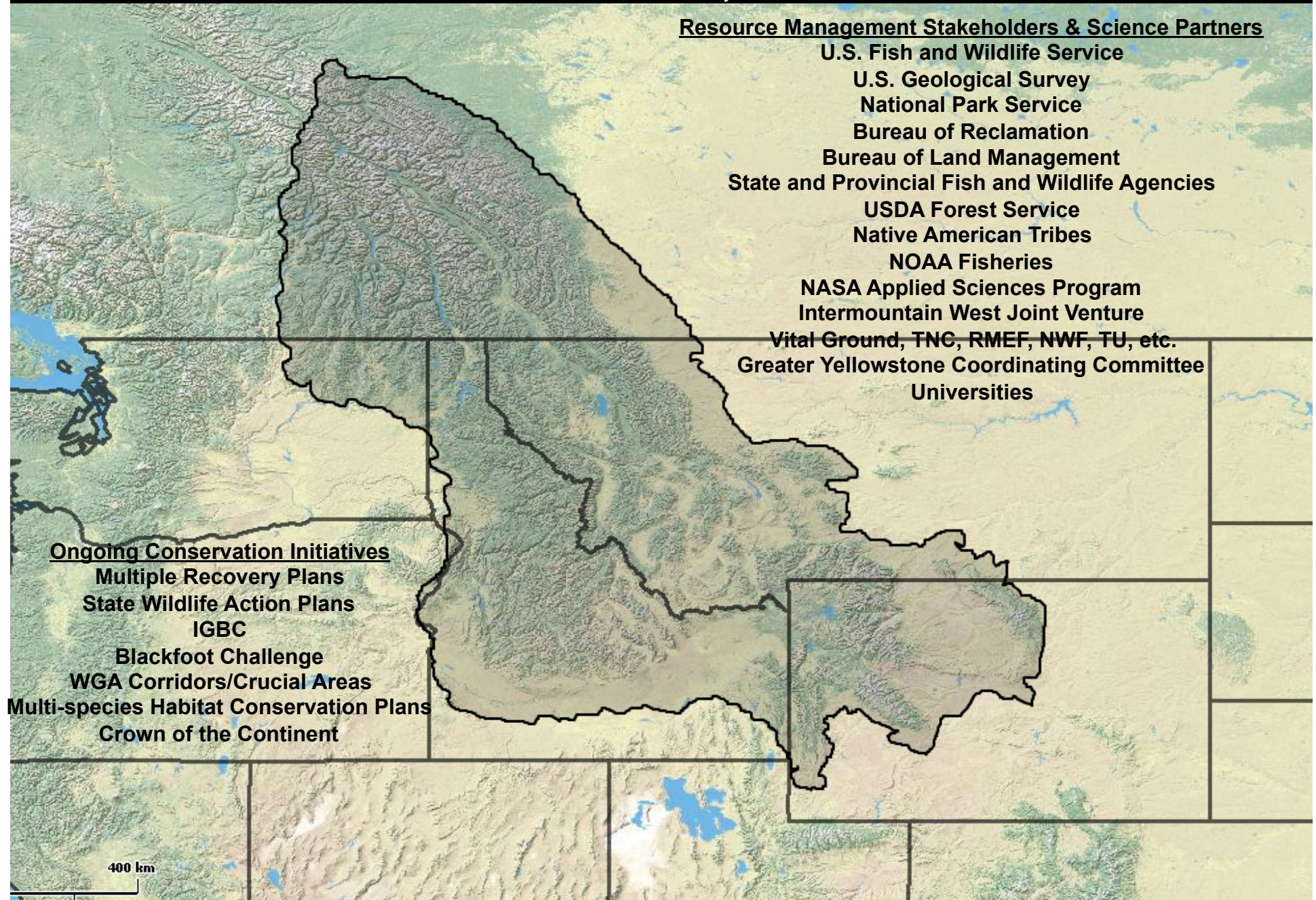
- Chronology of Northern Rockies Center Development
- Pieces, Parts, and Purpose of Proposed Northern Rockies Center
- DOI Objectives and “Plans”
- Regional and National Opportunities



Chronology of the Process

- **First cut USGS GCPO pilot “Regional Global Change Impacts Center (RGCIC), Northern Rockies Landscape”, version 1 white paper, now on version 11a**
- **Morphed to GCPO pilot “Regional Climate Impacts Center (RCIC)”, Northern Rockier landscape**
- **Morphed to DOI Regional CIC**
- **Morphed to DOI Regional Climate Change Response Center (RCCRC) and would be the NCCWSC Hubs “renamed”**
- **Presently called the DOI “Regional Climate Science Centers” and intent to incorporate and integrate ALL DOI bureau climate programs and plans**

Proposed Northern Rockies Climate Response Center Bozeman, MT



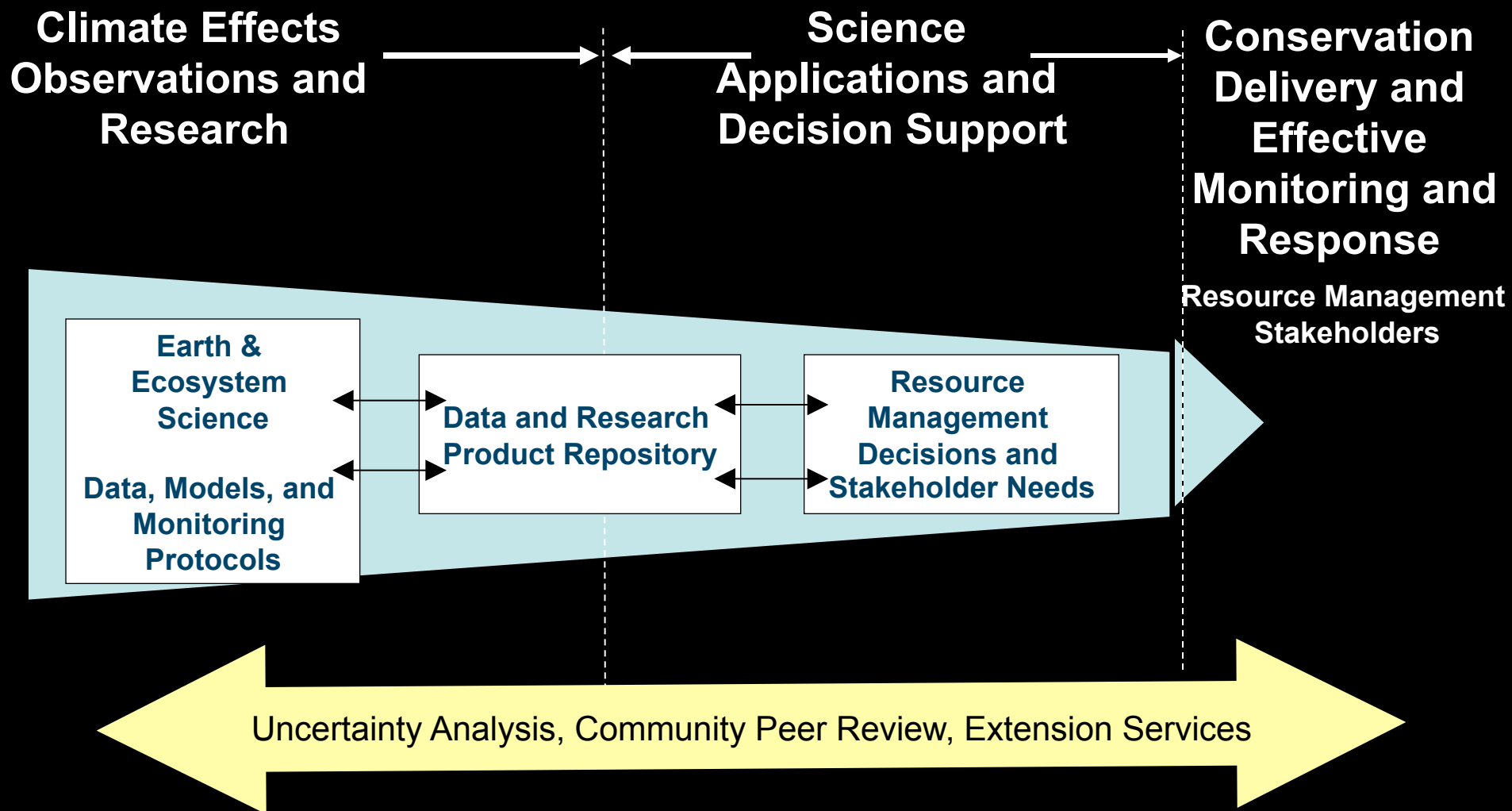
Resource Management Stakeholders & Science Partners

U.S. Fish and Wildlife Service
U.S. Geological Survey
National Park Service
Bureau of Reclamation
Bureau of Land Management
State and Provincial Fish and Wildlife Agencies
USDA Forest Service
Native American Tribes
NOAA Fisheries
NASA Applied Sciences Program
Intermountain West Joint Venture
Vital Ground, TNC, RMEF, NWF, TU, etc.
Greater Yellowstone Coordinating Committee
Universities

Ongoing Conservation Initiatives

Multiple Recovery Plans
State Wildlife Action Plans
IGBC
Blackfoot Challenge
WGA Corridors/Crucial Areas
Multi-species Habitat Conservation Plans
Crown of the Continent

Department of Interior Regional Climate Response Centers: Providing Decision Support Services for Application Partnerships in A Systematic Way



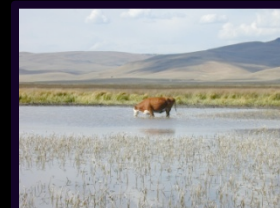


Decision support system: an interactive, computer-based system designed to help decision makers solve **poorly structured problems**. Using a combination of models, analytical techniques, and information retrieval, such systems help **develop and evaluate appropriate alternatives**. Decision support systems should focus on strategic decisions, not operational ones. More specifically, they should contribute to **identifying and reducing the uncertainty (if possible) faced by managers** when they need to make decisions regarding future options. The goal of decision support is to improve a decision maker's efficiency or effectiveness (Adelman 1992; D'Erchia et al. 2001; Graham and Jones 1988; Sprague and Carlson 1982).

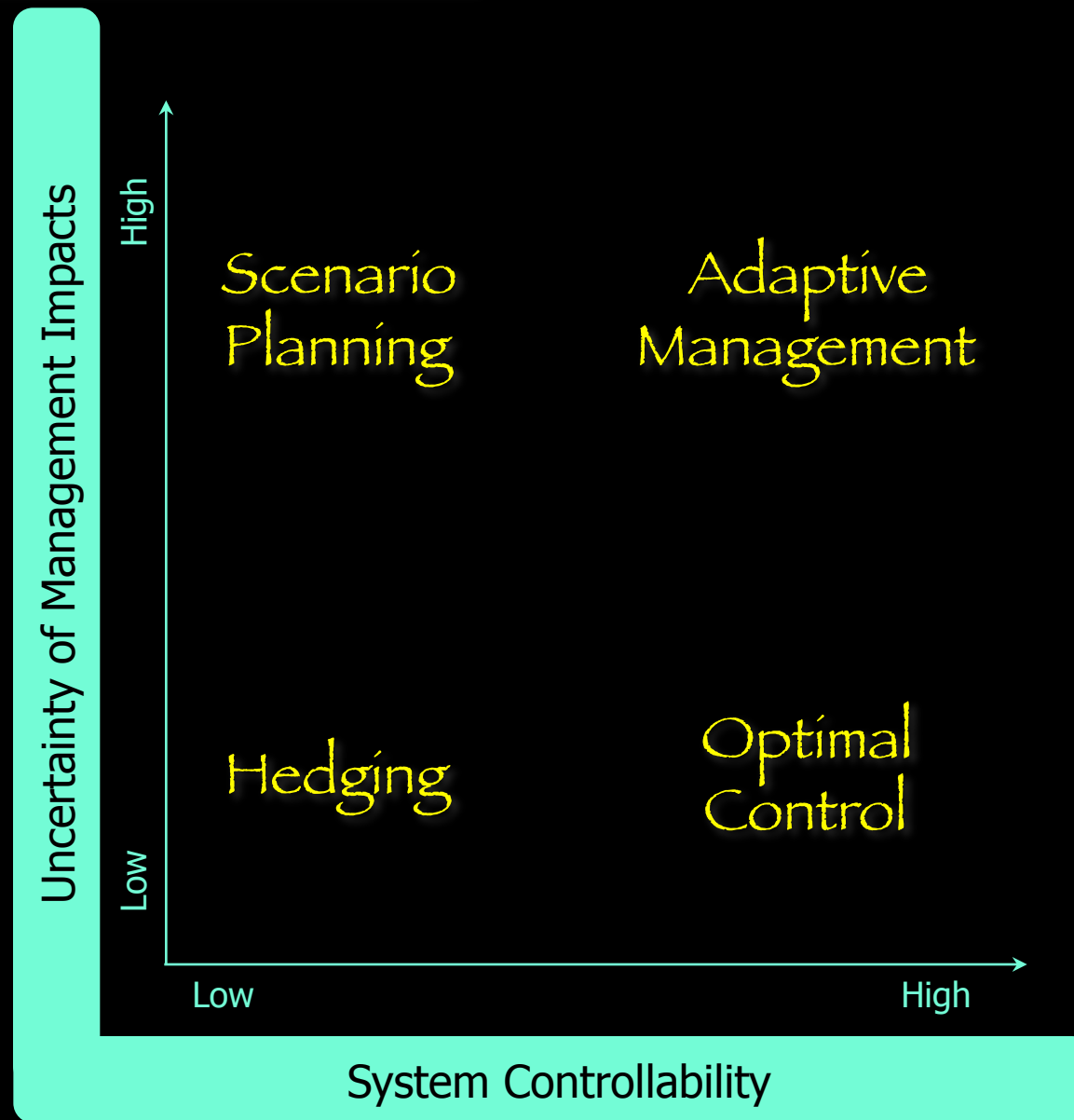
We see a nexus of interest in climate change conservation occurring in the Northern Rockies and much of the expertise and organization focused in Bozeman:

- Northern Rocky Mountain Science Center
- GCPO - Science Applications and Decision Support
- Northern Rockies LCC
- Federal, state, and tribal resource management agencies, esp. FWS & NPS
- MSU, especially RISA proposal
- NCCWSC Hub proposal
- NCCWSC BRD proposals
- Wildlife Conservation Society's North American Climate Program
- NPS' Greater Yellowstone Network
- NASA's Ecocast
- Engage NOAA Climatologists
- Wildlife Management Institute; Bipartisan Policy Center
- Climate Impacts Center
 - National Integrated Drought Information System, NOAA
 - Columbia River Basin Decision Support Demo
 - Downscaled climate modeling

One of our goals is to interject decision science
into the process; and, to emphasize
one foot in science and one foot in management...

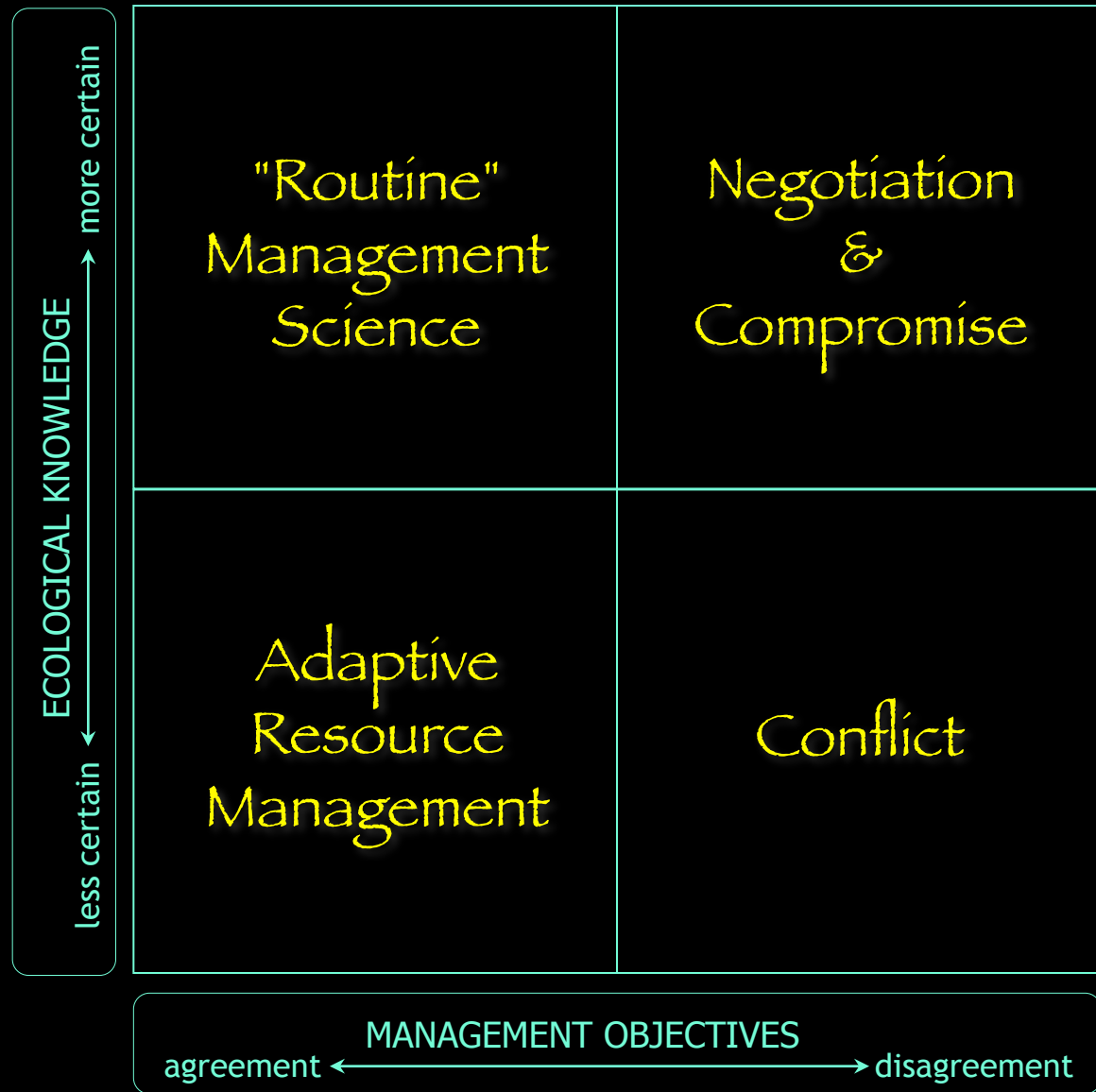


Approaches to Decision Making in Natural Resources



FROM: Williams, B. K., R. C. Szaro, and C. D. Shapiro. 2009. Adaptive Management: The U.S. Department of the Interior Technical Guide. Adaptive Management Working Group, U.S. Department of the Interior, Washington, DC. 84 pages.

Where does your decision fall regarding management objectives and ecological knowledge?



Assess Problem &
Alternatives

Set Objectives

Implement
Management

Monitor Response

Evaluate Using
Models

Make Adjustments

The Adaptive Management Process

Proposed Northern Rockies Climate Science Center will Provide Decision Support and Science Applications for the Northern Rockies

- 1) Builds upon existing partnerships to collaboratively provide science and data products for responding to climate change to advance outcome-based conservation across the landscape**
- 2) Underwrites the ability to support ecosystem resilience and resource management objectives considering climate effects INTEGRATED with ongoing stressors, i.e., Global Change Science and Applications**
- 3) In collaboration with resource managers, develops and provides decision support tools to address their needs through a “Climate Extension Agent” that are:**
 - timely**
 - useful**
 - responsive**
- 4) Provides sustained observations, applied and basic research, and models to support a robust and flexible adaptive management framework**

Addresses Congressional Concerns/Intent:

“Implementation of landscape scale planning in response to climate change offers an opportunity to consolidate science, management and support service offices. The Committee directs the Department to provide recommendations for implementing regional-landscape approaches and consolidating support services...”

DOI's Attempt to Integrate the Diverse Programs Across the Bureaus for Studying and Responding to Climate Variability and Change Through a "Climate Response Office"

Examples of Programs to be Integrated:

- **Adaptive Management Units - NPS**
- **National Adaptive Management Laboratory - BLM**
- **Landscape Conservation Cooperatives - FWS**
- **Regional Climate Impacts Centers and NCCWSC Hubs - USGS**



Opportunities????

- Plans are for up to 8 Regional Centers, 3 in FY10, 3 in FY11, and 2 in FY12
- Politically charged environment makes it a guessing game for Center locations
- Where do we begin on the ground, and do the regions/ watersheds that are not tapped in the first rounds wait???
- MOU in the works between Department of Commerce and Department of Interior
- Need for rigorous regional climate model code ala NCAR's Nested Regional Climate Model
- Need for true integrated Earth Systems Databases, Models, and Decision Support Tools ala Climate In A Box

*An Example For responding to the Opportunity:
Bringing Global Climate Change Model Projections to the
Watershed Scale: Pitfalls, Opportunities, and Uncertainties
for Decision Support*

- *Watershed-Scale Applied Science Questions?*
 - (1) How can global predictions of the effects of future rapid climate change and variability be enhanced and used?
 - (2) How are uncertainties in global projections compounded, or not, at the watershed scale?
 - (3) What are the implications for decision-support?



Beluka Glacier, Siberia, Russia



Upper Fremont Glacier, Wyoming, USA



Øksfjordjøkelen, Norway

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